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EXAMINER	
TAYONG, HELENE E	

ART UNIT	PAPER NUMBER
2611	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/777,178	FITTON ET AL.	
	Examiner	Art Unit	
	Helene Tayong	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed 10/12/07.

Claims 1-25 are currently pending, and Claims 1-24 are amended.

A certified copy of the priority document is submitted herewith. Applicants respectfully request that the objection to Applicants' claim to priority be withdrawn.

Applicants respectfully traverse the objection to Claims 16-22. Claim 15, from which Claim 16 depends, is directed to a method. Accordingly, Applicants submit that amending Claim 16 to recite a "determining means," as suggested by the outstanding Official Action, is not required. Thus, Applicants respectfully request that the objection to Claims 16-22 be withdrawn. Claims 1-25 are rejected and have been considered below.

Response to Arguments

2. ***(1) with regards to Priority;***

Applicant's arguments, see objection to applicant's claim to priority, have been fully considered and are persuasive. The objection to applicant's claim to priority has been withdrawn.

(2) with regards to claim objection 16-22;

Applicant's arguments, see objection to claims 16-22, have been fully considered and are persuasive. The objection to claims 16-22 has been withdrawn.

(3) with regards to claims 1-25;

Applicant's arguments, see the rejection under 35 U.S.C. § 102(b) as being

anticipated by Nakazawa (US 5563909), reject1on of Claim 4 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa in view of U.S. Patent No. 6,920,192 to Laroia et al. (hereinafter Laroia); reject10n of Claim 5 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa and Laroia, and further in view of U.S. Patent No. 4,606,047 to Wilkinson; rejection of Claim 6 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa, Laroia, and Wilkinson, and further in view of U.S. Patent No. 7,035,612 to Kishimoto et al. (Kishimoto); rejection of Claim 9 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa in view of Kishimoto; rejection of Claim 12 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa in view of U.S. Patent No. 6,967,994 to Boer et al. (hereinafter Boer); rejection of Claim 14 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa in view of Kishimoto; rejection of Claim 18 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa in view of Wilkinson; rejection of Claims 21 and 22 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa in view of Kishimoto; and rejection of Claims 23-25 under 35 U.S.C. § 103(a) as unpatentable over Nakazawa in view of Boer have been considered but are moot in view of the new ground(s) of rejection.

Applicant's argument's: "*Nakazawa fails to disclose or suggest selecting "an antenna branch from said plurality of antenna branches responsive to a measure of multipath fading for the received signals determined from said corresponding frequency domain output signal," as recited in Claim 1. Nakazawa merely describes that the best received signal from the individual received signals is selected without describing the means of analyzing the best received signal. That is, Nakazawa merely states that the*

selection should be performed to select a received wave with excellent propagation characteristics.4 Thus, one of ordinary skill in the art, in light of Nakazawa, would be restricted to conventional measurements such as received power or the signal to noise interference ratio".

Examiner's response- Nakazawa in figure 2, discloses an analyzing means (19) and selecting means (20) for comparing each of the **propagation characteristics** of those received waves which are transmitted from an identical mobile station and received by different antennas, on the basis of the results of the analyses carried out by the analyzing means, and permitting a received wave having excellent propagation characteristics to be supplied from the corresponding antenna to a receiving circuit (col.3, lines 43-51 and col. 4, lines 5-39).

Applicant's argument's : *"Nakazawa discloses the feature of "determining a measure of multipath fading for the received signal from each antenna from said frequency domain transformed signal," as recited in Claim 15. This cited portion of Nakazawa merely describes that power values of individual received signals with frequencies F_{T1} to F_{TM} are output from a power calculating circuit. However, Nakazawa neither discloses nor suggests that a measure of multipath fading is determined from the calculated power levels of the received signals.*

Examiner's response- Nakazawa in figure 9, 51,52, col.7, lines 39-67 and col. 8, lines 1-26) discloses determining a measure of multipath fading for the received signal from each antenna from said frequency domain transformed signal.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 14 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In claim 14, a "computer - readable medium" is being recited; however, a computer - readable medium would reasonably be interpreted by one of ordinary skill in the art as software per se. This subject matter is not limited to that which falls within a statutory category of invention (i.e. it is not a process, machine, manufacture, or a composition of matter). Software is functional descriptive material and functional descriptive material is non-statutory subject matter.

Computer programs claimed as computer per se, i.e., the description or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-842 32 USPQ2d at

1035.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3,7-8,10-11,13,15-17and19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977).

As shown in figure 2, Nakazawa discloses an antenna branch selector for selecting for processing at least one of a plurality of antenna branches (11a-11n) each coupled to a respective receive antenna (13a-13n) and carrying a received signal, said antenna branch selector comprising:

(1) Regarding claim 1;

(a) a signal selector (20) having a plurality of inputs to receive signals from said plurality of antenna branches and having an output to output a selected signal for processing (fig. 2, 20, col. 3, lines 43-51);

(b) a time-to-frequency domain converter (18) configured to receive a time domain signal from each of said plurality antenna branches and to provide a corresponding frequency domain output signal (fig. 2, 15a-15n, col. 4, lines 1-4); and

(c) a controller (19)coupled to said time-to-frequency domain converter and to said signal selector to control said signal selector to select

Nakazawa '909 discloses in (fig. 2, 19, col. 4, lines 5-11) an analyzing means

which analyzes the propagation characteristics of the individual received waves, but Nakazawa '909 does not explicitly disclosed that the propagation characteristics include multipath fading .

However, Nakazawa '977' in the same endeavor discloses propagation characteristics that include multipath fading (fig. 1, 5 and col. 3, lines 60-67 and col. 4, lines 1-6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized the method of Nakazawa '977' in the method of Nakazawa '909 in order for an antenna branch from said plurality of antenna branches responsive to a measure of multipath fading for the received signals determined from said corresponding frequency domain output signal. The motivation to utilized the method of Nakazawa '977' in the method of Nakazawa '909 would be to enable communication system to be able to transmit high-quality data at high speeds (col. 1, lines 36-37).

(2) Regarding claim 2;

Nakazawa '909 further discloses wherein said controller is configured to select a said antenna branch from said plurality of antenna branches responsive to a difference between a signal level at a first frequency and a signal level at a second frequency in a frequency domain output signal for an antenna branch (fig.9, 50a, col. 7, lines 13-51).

(3) Regarding claim 3;

Nakazawa '909 further discloses wherein said first and second frequencies comprise frequencies of said received signal corresponding to said selected antenna branch (col. 4, lines 57-65).

(4) Regarding claim 7;

Nakazawa '909 further discloses wherein said controller is configured to select a said antenna branch responsive to a comparison of said difference in signal level for one said antenna branch with said difference in signal level for another said antenna branch (col. 4, lines 57-65).

(5) Regarding claim 8;

Nakazawa '909 further discloses wherein said controller is further configured to determine an indication of received power for a said antenna branch, and wherein said controller is further configured to select a said antenna branch responsive to said received power indication (col. 7, lines 13-23).

(6) Regarding claim 10;

Nakazawa '909 further discloses wherein said controller is responsive to a sum of signal levels at a plurality of said third frequencies (fig. 8,45, col.6, lines 9-11).

(7) Regarding claim 11;

Nakazawa '909 further discloses wherein said received signal comprises a packet data signal including a payload signal portion, and

said controller is further configured to control said signal selector during said payload signal portion (fig. 6, col. 5, lines 21-28). (8) Regarding claim 13;

Nakazawa '909 further discloses a receiver including the antenna branch selector of claim 1 (col. 11, lines 7-12).

(9) Regarding claim 15;

(a) Nakazawa '909 further discloses transforming a received signal from each antenna in said plurality of antennas from the time domain to the frequency domain (fig. 3, 34) and (col. 5, lines 8-13);

(b) determining a measure of multipath fading for the received signal (interpreted as propagation characteristics) from each antenna from said frequency domain transformed signal (col. 6, lines 7-25); and

(c) selecting a received signal responsive to said determined measure of multipath fading (col. 6, lines 37-49).

(10) Regarding claim 16;

Nakazawa '909 further discloses wherein said determining comprises comparing signal levels of said selected received signal at two or more frequencies (col. 7, lines 39-44).

(11) Regarding claim 17;

Nakazawa '909 further discloses wherein said selected received signal comprises a packet data signal including a preamble portion and

said determining is performed during said preamble signal (col. 5, lines 21-28 and fig. 3, 36 and fig. 6)

(12) Regarding claim 19;

Nakazawa '909 further discloses determining a measure of received signal strength for each received signal from each antenna from said plurality of antennas using frequency domain transformed signal, wherein said selecting is further responsive to said determined measure of received signal strength (fig. 8, 35, col. 5,

lines 57-65).

(13) Regarding claim 20;

Nakazawa '909 further discloses determining a measure of received signal to noise and/or interference ratio (interpreted as propagation characteristics) for each received signal from each antenna from said plurality of antennas using frequency domain transformed signal wherein said selecting is further responsive to said determined measure of received signal to noise and/or interference ratio(col. 5, lines 57-65) and (col. 8, lines 27-51).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977) as applied in claim 1 above, and further in view of Laroia et al. (US 6920192).

(1) Regarding claim 4;

Nakazawa '909 as modified by Nakazawa '977discloses all of subject matter as described above except for specifically teaching wherein said received signal corresponding to said selected antenna branch has, in the frequency domain, at least two tones, and wherein said first and second frequencies comprise frequencies of said at least two tones.

However, Laroia et al. in the same field of endeavor, teaches wherein a said received signal has, in the frequency domain, at least two tones, and wherein said first and second frequencies comprise frequencies of said tones (fig. 4, col. 5, lines 1-5 and col. 4, lines 64-67).

In cellular wireless systems with adaptive antenna arrays, the multiple antenna of the array are typically deployed at the base station of each cell, and the signals transmitted or received by the antennas are linearly combined with certain complex weights. By properly adjusting the antenna weights, the multiple antennas can improve signal-to interference ratio (SIR) and receive diversity.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize frequencies of tones of Laroia et al's in the branch selector of Nakazawa '909 as modified by Nakazawa '977 to reduce interference in cellular wireless systems. The motivation to utilize Laroia et al's frequencies of tones in the branch selector of Nakazawa '909 as modified by Nakazawa '977was to provide frequency diversity.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977) and further in view of Laroia et al. (US 6920192) as applied in claim 4 above, and further in view of Wilkinson (4606047).

(1) Regarding claim 5;

Nakazawa '909 as modified by Nakazawa '977 and Laroia et al. discloses all of subject matter as described above except for specifically teaching wherein said received signal comprises a packet data signal including a preamble signal portion, and wherein said tones comprise tones of said preamble signal portion.

However, Wilkinson in the same field of endeavor, teaches wherein said received signal comprises a packet data signal including a preamble signal portion, and wherein

said tones comprise tones of said preamble signal portion (fig. 3, col5, lines 12-26).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for transmitting and receiving radio frequencies signals, frequency selective fading and intersymbol interference can occur across the high frequency band because of ionoshheric induced variations in multipath propagation. To overcome the undesirable effects of multipath propagation, appropriate signal processing before and after transmission can be done by using packet data signals with preambles. The motivation to utilize Wilkinson's signals instead of Nakazawa's was to improve on received signal quality.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977) and further in view of Laroia et al. (US 6920192) and further in view of Wilkinson (4606047) as applied to claim 5 above, and further in view of Kishimoto (7035612).

(1) Regarding claim 6;

Nakazawa '909 as modified by Nakazawa'977, Laroia et al and Wilkinson discloses all of subject matter as described above except for specifically teaching wherein said received signal corresponding to said selected antenna branch comprises a Bluetooth compatible signal.

However, Kishimoto in the same field of endeavor, teaches wherein said received signal corresponding to said selected antenna branch comprises a Bluetooth compatible signal (col. 8, lines 54-64).

It would have been obvious to one of ordinary skill in the art at the time the

invention was made to recognize that the frequency diversity effect is difficult to achieve in the low speed frequency hopping mode because a plurality of information symbols are transmitted on a single frequency. To overcome this problem, the antenna diversity mode is used with the frequency hopping mode at the same time (col. 3, lines 17-26). Bluetooth is used as an example of a digital wireless communications system using low speed frequency hopping mode (col. 3, lines 39-41). The motivation to utilize Kishimoto et al.'s bluetooth signals instead of Nakazawa's '909 as modified by Nakazawa'977, Laroia et al and Wilkinson was to improve on transmission quality.

9. Claims 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5563909) as applied in claim 3 above, and further in view of Kishimoto et al.(7035612 B2).

(1) Regarding claim 9;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching wherein said controller is further configured to select said antenna branch responsive to a difference between signal levels in said frequency domain signal for an antenna branch at a third frequency comprising a frequency of said received signal and at a fourth frequency comprising a frequency at which substantially no signal level from said received signal is expected.

However, Kishimoto et al. in the same field of endeavor, teaches wherein said controller is further configured to select a said antenna branch responsive to a difference between signal levels in said frequency domain signal for an antenna branch

at a third frequency comprising a frequency of said received signal and at a fourth frequency comprising a frequency at which substantially no signal level from said received signal is expected (fig. 5 step 10-16 col. 9, lines 25-47 and col. 11, lines 53-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize frequency difference of Kishimoto et al's with the system Nakazawa's '909 as modified by Nakazawa'977in order to improve communications performance by increasing the affinity between frequency hopping and antenna diversity communications. The motivation to utilize Kishimoto et al.'s frequency difference instead of Nakazawa's '909 as modified by Nakazawa'977 was to improve on transmission and reception quality.

10. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977) as applied in claim 11 above , and further in view of Boer et al. (US 6967994 B2) .

(1) Regarding claim 12;

Nakazawa 909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching wherein said controlling of said signal selector during said payload signal portion is conditional upon a Doppler frequency shift of said received signal being greater than a threshold value.

However, Boer et al. in the same field of endeavor, teaches wherein said controlling of said signal selector during said payload signal portion is conditional upon a Doppler frequency shift of said received signal being greater than a threshold value.

(col.3, lines 36-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of Boer et al. with the method of Nakazawa 909 as modified by Nakazawa'977 in order to determine what the propagation conditions of channel will be. The motivation to combine the method of Nakazawa '909 as modified by Nakazawa'977 the method of Boer et al would be to improve detection quality.

11. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977 and further in view of Langberg et al (US 5852630).

(1) Regarding claim 14;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching the method written by a software program embodied in a computer-readable medium.

However, Langberg et al. teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium. The computer-readable medium is an electronic, magnetic, optical, or other physical device or means that can be contain or store a computer program for use by or in connection with a computer-related system or method (column 3, lines 51-65). One of ordinary skilled in the art would have clearly recognized that the method of Nakazawa '909 as modified by Nakazawa'977 would

have been implemented in software. The implemented software would perform same function of the hardware for less expense, adaptability, and flexibility. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention was made to use the software as taught by Langberg et al. in the method of Nakazawa '909 as modified by Nakazawa'977 in order to reduce cost and improve the adaptability and flexibility of the communication system.

12. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977) as applied in claim 17 above, and further in view of Wilkinson (US 4606047 B2) .

(1) Regarding claim 18;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching wherein said two frequencies comprise tones of said preamble signal.

However, Wilkinson in the same field of endeavor, teaches wherein said two frequencies comprise tones of said preamble signal (fig. 2, col.4, lines 52-65).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for transmitting and receiving radio frequencies signals, frequency selective fading and intersymbol interference can occur across the high frequency band because of ionoshheric induced variations in multipath propagation. To overcome the undesirable effects of multipath propagation, appropriate signal processing before and after transmission can be done by using packet data

signals with preambles. The motivation to utilize Wilkinson's signals instead of Nakazawa's '909 as modified by Nakazawa'977 was to improve on received signal quality.

13. Claims 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977) as applied in claim 17 above, and further in view Kishimoto et al(7035612 B2).

(1) Regarding claim 21;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching wherein said packet data signal includes a payload portion and said method further comprising monitoring a received signal indicator during reception of said payload portion and selecting a received signal responsive to said monitoring.

However, Kishimoto et al in the same field of endeavor, teaches wherein said packet data signal includes a payload portion and further comprising monitoring a received signal indicator during reception of said payload portion and selecting a received signal responsive to said monitoring (col. 2, lines 58-63)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for transmitting and receiving radio frequencies signals, frequency selective fading and intersymbol interference can occur across the high frequency band because of ionoshheric induced variations in multipath propagation. To overcome the undesirable effects of multipath propagation, appropriate signal processing before and after transmission can be done by using packet data

signals with preambles. The motivation to utilize Kishimoto et al's packet data signal that includes a payload portion instead of Nakazawa's '909 as modified by Nakazawa'977 was to improve on received signal quality and check for transmission errors.

(2) Regarding claim 22;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching wherein monitoring a received signal frequency change parameter, wherein said selecting of the received signal responsive to said monitoring is responsive to said frequency change parameter.

However, Kishimoto et al in the same field of endeavor, teaches wherein said packet data signal includes a payload portion and further comprising monitoring a received signal indicator during reception of said payload portion and selecting a received signal responsive to said monitoring (col. 2, lines 58-63)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to recognize that for transmitting and receiving radio frequencies signals, frequency selective fading and intersymbol interference can occur across the high frequency band because of ionoshheric induced variations in multipath propagation. To overcome the undesirable effects of multipath propagation, appropriate signal processing before and after transmission can be done by using packet data signals with preambles. The motivation to utilize Kishimoto et al's received signal frequency change parameter instead of Nakazawa's '909 as modified by Nakazawa'977 was to improve on received signal quality and check for transmission errors.

14. Claims 23 ,24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakazawa (US 5563909) in view of Nakazawa (US 5710977) and further in view of Boer et al. (US 6967994 B2) .

(1) Regarding claim 23;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching

(a) means for selecting said received signal responsive to a received signal parameter measured during said preamble signal;

(b) means for determining a Doppler frequency change of said received signal; and

(c) means for reselecting said received signal during said payload signal conditional upon said determined Doppler frequency change being greater than a threshold frequency change.

(i) Regarding item (a)

Boer et al. in the same field of endeavor, teaches means for a received signal parameter measured during said preamble signal (col.2, lines 44-48)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Boer et al.'s received signal parameter measured during said preamble signal to the system of Nakazawa '909 as modified by Nakazawa'977 in order to provide the receiver with quality measure signal. The motivation to utilize Boer et al's received signal parameter measured during said preamble signal instead of those of Nakazawa '909 as modified by Nakazawa'977 was to provide quality detection at the

receiver end and hence increase throughput of data transmission.

(ii) Regarding item (b)

Boer et al. in the same field of endeavor, teaches means for determining a Doppler frequency change of said received signal (col.2, lines 48-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Boer et al.'s received signal parameter measured during said preamble signal to the system of Nakazawa '909 as modified by Nakazawa'977 in order to provide the receiver with quality measure signal. The motivation to utilize Boer et al's Doppler frequency change of said received signal instead of those of Nakazawa'909 as modified by Nakazawa'977 was to provide quality detection at the receiver end and hence increase throughput of data transmission.

(iii) Regarding item (c)

Boer et al. in the same field of endeavor, teaches means for reselecting said received signal during said payload signal conditional upon said determined frequency change being greater than a threshold frequency change (col.3, lines 36-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of Boer et al. with the system of Nakazawa in order to determine what the propagation conditions of channel will be. The motivation to combine these would be to improve detection quality.

(2) Regarding claim 24;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching

(a) selecting said received signal responsive to a received signal parameter measured during said preamble signal;

(b) determining a Doppler frequency change of said received signal; and

(c) reselecting said received signal during said payload signal conditional upon said determined frequency change being greater than a threshold frequency change.

(i) Regarding item (a) above;

Boer et al. in the same field of endeavor, teaches a received signal parameter measured during said preamble signal (col.2, lines 44-48).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Boer et al.'s received signal parameter measured during said preamble signal to the system of Nakazawa '909 as modified by Nakazawa'977 in order to provide the receiver with quality measure signal. The motivation to utilize Boer et al's received signal parameter measured during said preamble signal instead of those of Nakazawa '909 as modified by Nakazawa'977 was to provide quality detection at the receiver end and hence increase throughput of data transmission.

(ii) Regarding item (b) above;

Boer et al. in the same field of endeavor, teaches determining a Doppler frequency change of said received signal (col.2, lines 48-54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Boer et al.'s determining a Doppler frequency change of

said received signal to the system of Nakazawa '909 as modified by Nakazawa'977 in order to provide the receiver with quality measure signal. The motivation to utilize Boer et al's determining a Doppler frequency change of said received signal instead of those of Nakazawa '909 as modified by Nakazawa'977 was to provide quality detection at the receiver end and hence increase throughput of data transmission.

(iii) Regarding item (c) above;

Boer et al. in the same field of endeavor, teaches means for reselecting said received signal during said payload signal conditional upon said determined frequency change being greater than a threshold frequency change (col.3, lines 36-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the method of Boer et al. with the system of Nakazawa '909 as modified by Nakazawa'977 in order to determine what the propagation conditions of channel will be. The motivation to combine these would be to improve detection quality.

(3) Regarding claim 25;

Nakazawa '909 as modified by Nakazawa'977 discloses all of subject matter as described above except for specifically teaching wherein said threshold frequency change is dependent upon the duration of a said packet.

However, Kishimoto et al. in the same field of endeavor, teaches wherein said threshold frequency change is dependent upon the duration of a said packet (col. 3, lines 38-48).

Antenna diversity, is a mode in which signal fading at an antenna is reduced by

using a plurality of antennas with low fading correlations. The signals from the antennas are switched to the receiver depending on the levels of signals at the antennas. To reduce the effects of fading and other propagation characteristics, it would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize method of Kishimoto et al. in the system of Nakazawa '909 as modified by Nakazawa'977. The motivation to combine this method would be to improve on transmission and detection quality.

Conclusion

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Helene Tayong whose telephone number is 571-270-1675. The examiner can normally be reached on Monday-Friday 8:00 am to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Liu Shuwang can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Helene Tayong

12/26/07

Shuwang Liu

SHUWANG LIU
SUPERVISORY PATENT EXAMINER